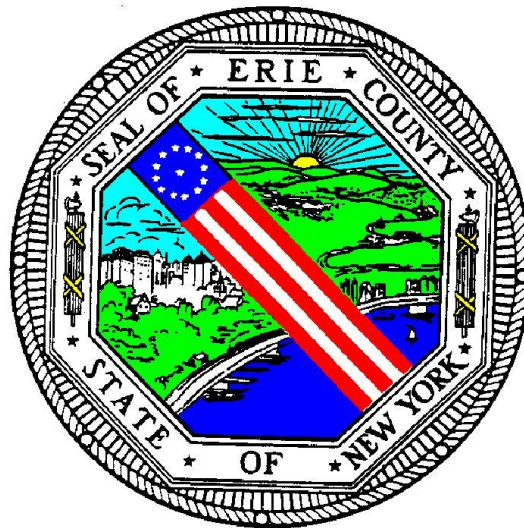


UB Center for Industrial Effectiveness



School of Engineering and Applied Sciences

E-911 Public Safety Answering Points Cost Avoidance





SOME QUICK DEFINITIONS

PSAP – Public Safety Answering Points (we have 21 of these in Erie Co, plus a small backup center)

CPS – Central Police Services (the designated PSAP Coordinator for Erie County)

ECSO or ECS - Erie County Sheriff's Office

MERS – Medical Emergency Response Services

BPD and BFD – Buffalo Police or Fire Department

PSD – Public Safety Dispatcher (a person who is Call Taker, Dispatcher or Both)

PSC – Public Safety Campus (the Downtown PSAP)



PROJECT TEAM MEMBERS



Champions:

Commissioners Peter M. Vito and Greg Skibitsky

Team:

John Adolf, Emergency Services

Joe Cercone, Budget

Marlaine Hoffman, Central Police Services
Green Belt Candidate

Deputy Scott Joslyn, Erie County Sheriff

Captain Ron Kenyon, Erie County Sheriff

Michelle Kerr, Senior Complaint Writer, Central Police Services

Dan Neaverth, Emergency Services; Yellow Belt

Jerry Whittington, Fire Services Representative; Emergency Services



Mentor: **John Lupienski** (Master Black Belt)



PROJECT CHARTER



Strategic Goal/Business Case: There are 21 Public Safety Answering Points (PSAPs) in Erie County, with a total of 95 Call Taking Positions. The hardware currently used in at least 59 of these positions will be obsolete by 2010. It must be replaced.

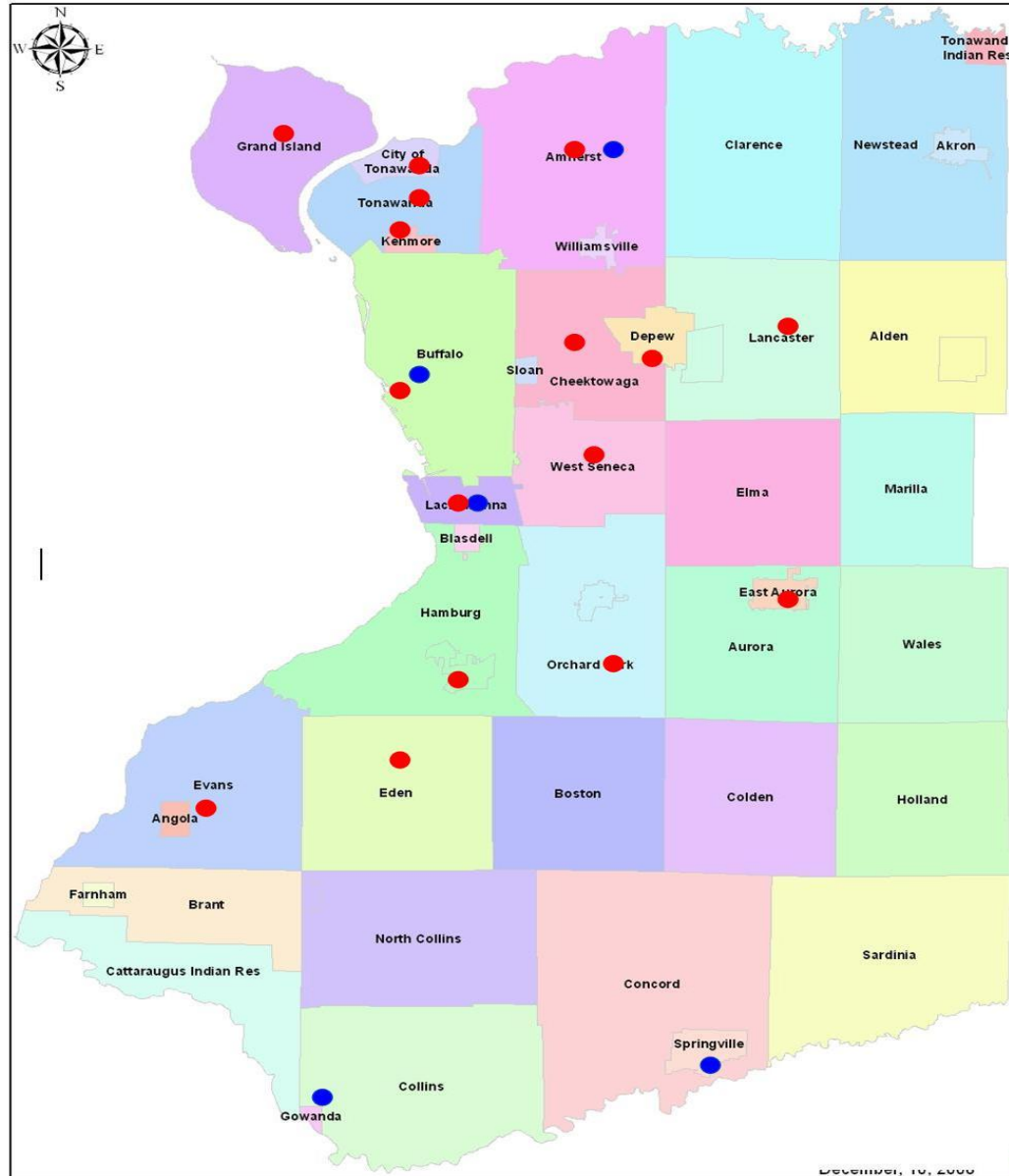
Problem Statement: The cost of the basic tools to answer an E-911 call will be rising dramatically by 2010. The cost is driven by the amount of call takers and PSAPs.

Project Objective: Reduce the future cost while preserving the safety of the citizens of Erie County. Determine the optimum number of seats needed to effectively answer E-911 calls in Erie County.



Perception
Geography Plays A Role

**LOCATION OF PUBLIC
 SAFETY ANSWERING
 POINTS**



- PRIMARY**
- Amherst PD
 - Buffalo/ECSO/ MERS
 - Cheektowaga PD
 - Depew PD
 - E Aurora PD
 - Eden PD
 - Evans PD
 - T/hamburg PD
 - Grand Island Fire
 - Kenmore PD
 - Lackawanna PD
 - Lancaster PD
 - Orchard Park PD
 - C/Tonawanda PD
 - T/Tonawanda PD
 - W Seneca PD
- SECONDARY**
- Amherst Fire
 - Buffalo Fire
 - Helmuth Fire
 - Lackawanna Fire
 - Springville Fire

ERIE COUNTY PSAPS

PROJECT CHARTER



Benefits/Savings Potential: If all 95 positions are replaced, **Erie County will spend over \$8.9 million.** In addition, new, redundant network lines must be installed between each of the 21 PSAPs, which adds to the costs. If we can reduce the amount of PSAPs, or the amount of call takers within the PSAPs, we can avoid spending a portion of the \$8,998,100.

Scope/Boundaries: The project will concentrate on the cost per call at each center and attempt to determine the optimum number of call takers needed Countywide to answer the volume of calls in the County, both landline and wireless. **Should PSAPs be realigned to make them more cost effective?**

Timeline: Complete Recommendations: June 2009
Execute plan: 2009 - 2011



GOAL STATEMENT



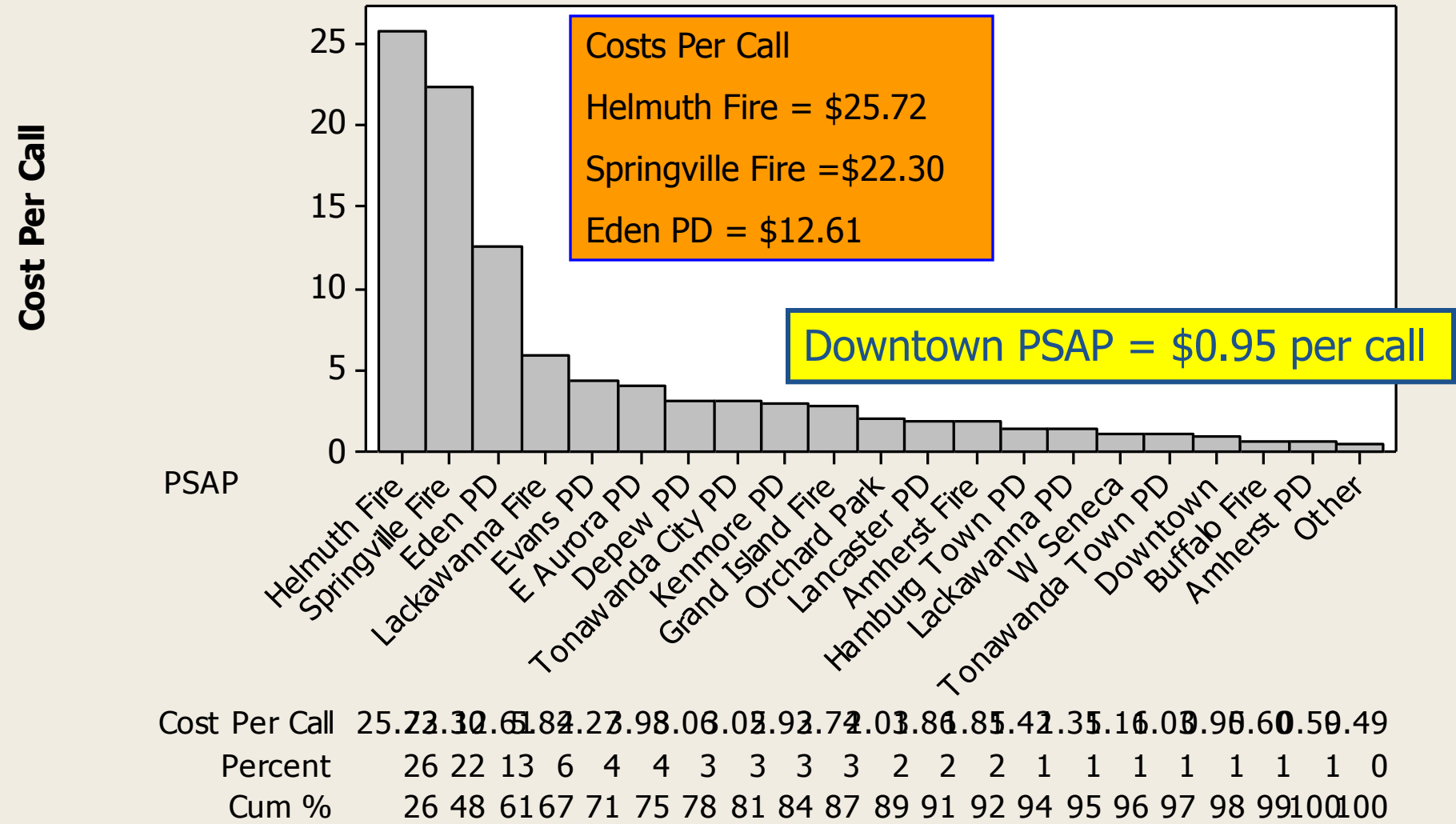
The most critical requirement is to provide efficient response to 911 calls ensuring the highest quality of Public Safety while avoiding unnecessary expense to the taxpayers (customers).

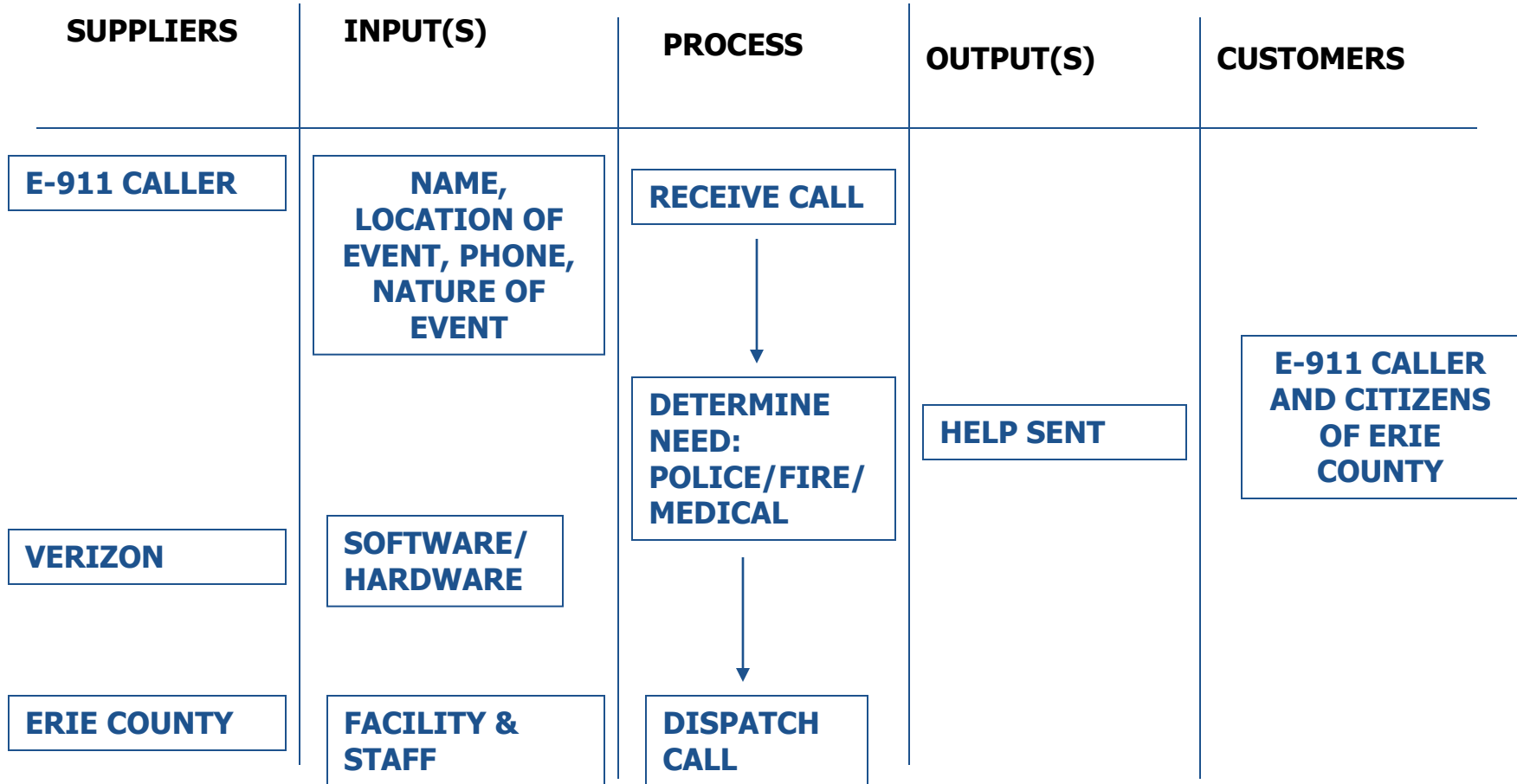


COST PER CALL PER PSAP



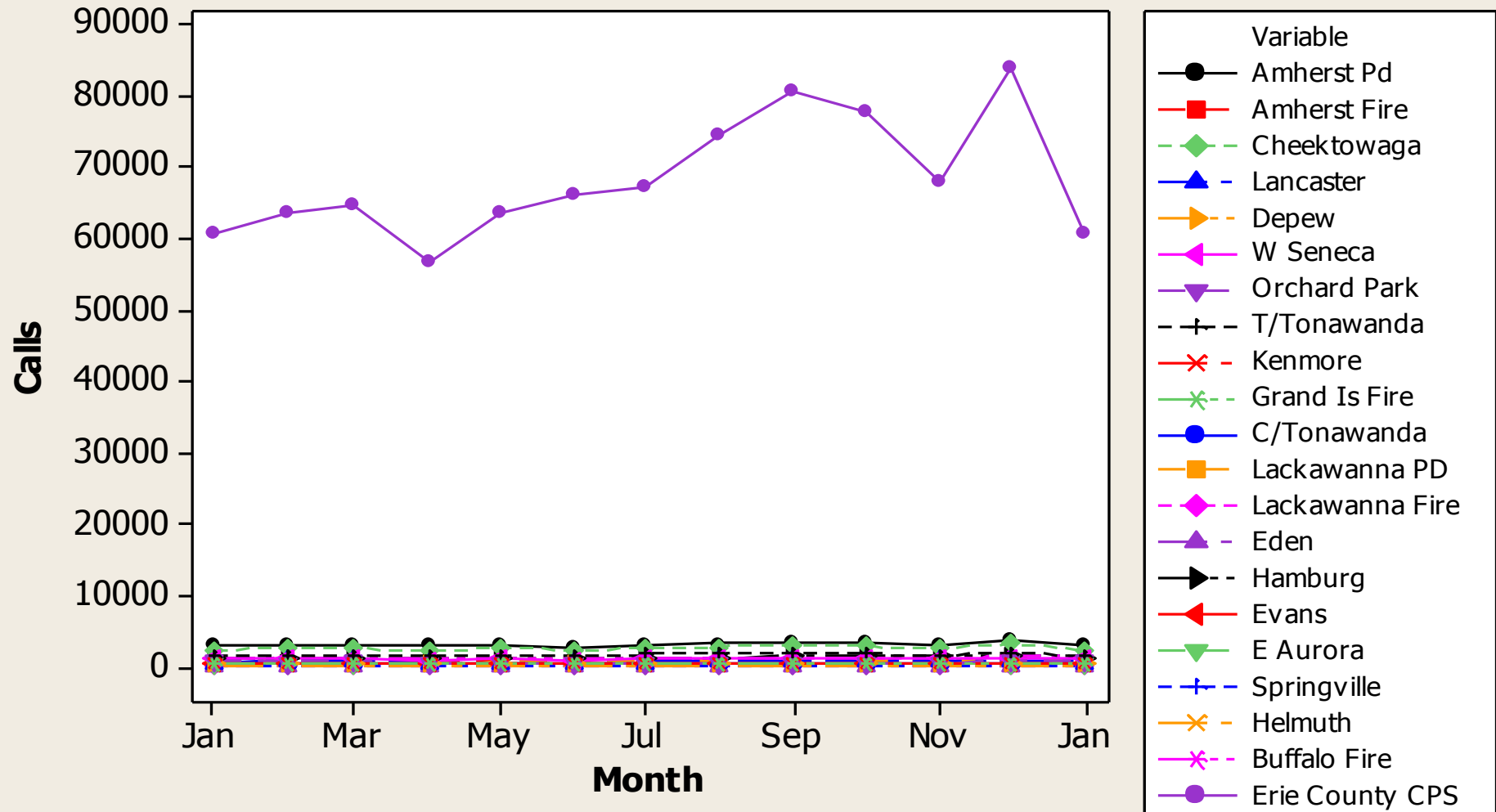
Pareto Chart of Current PSAP Costs





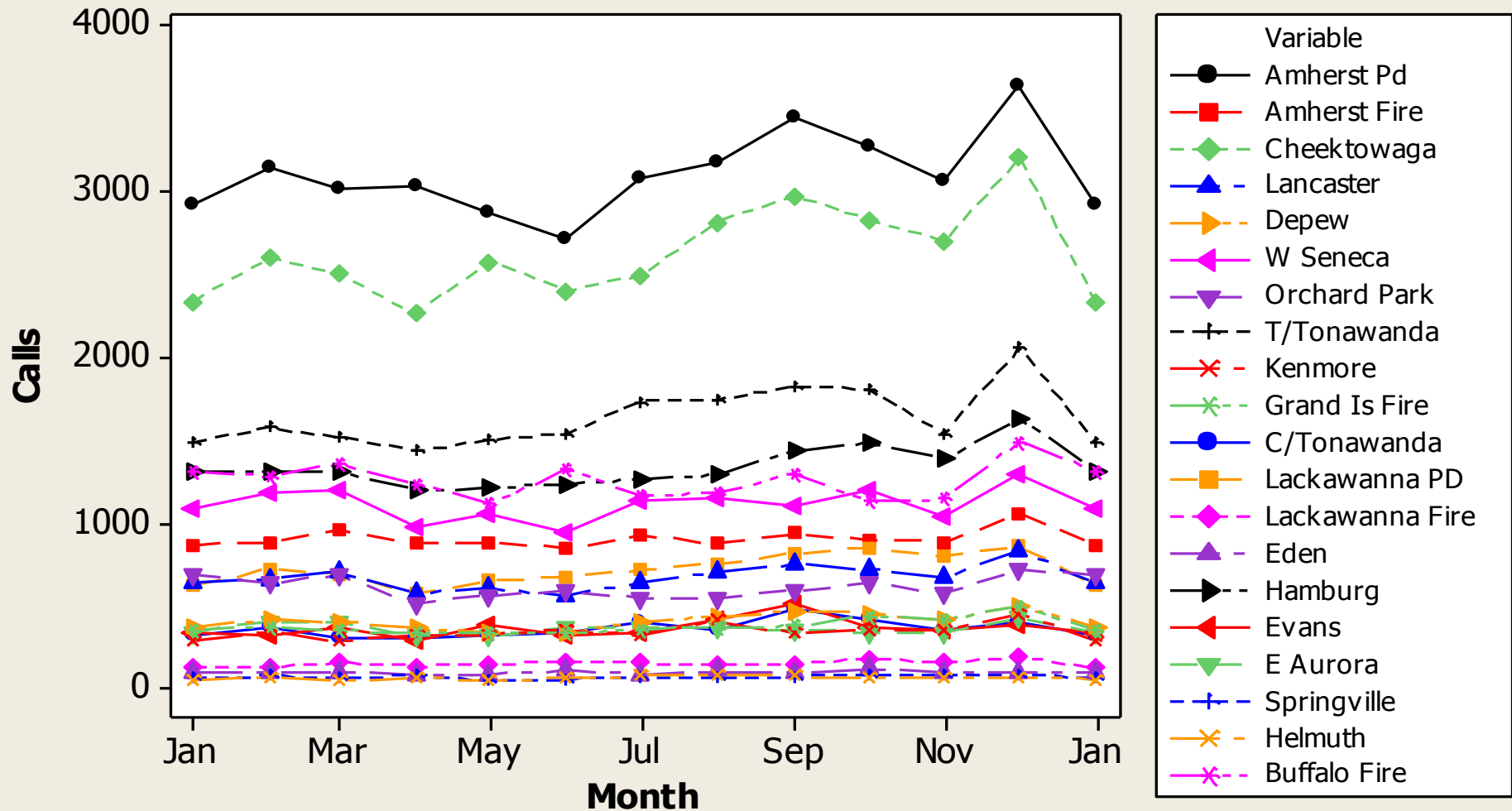


Time Series Plot of All Erie County PSAPs



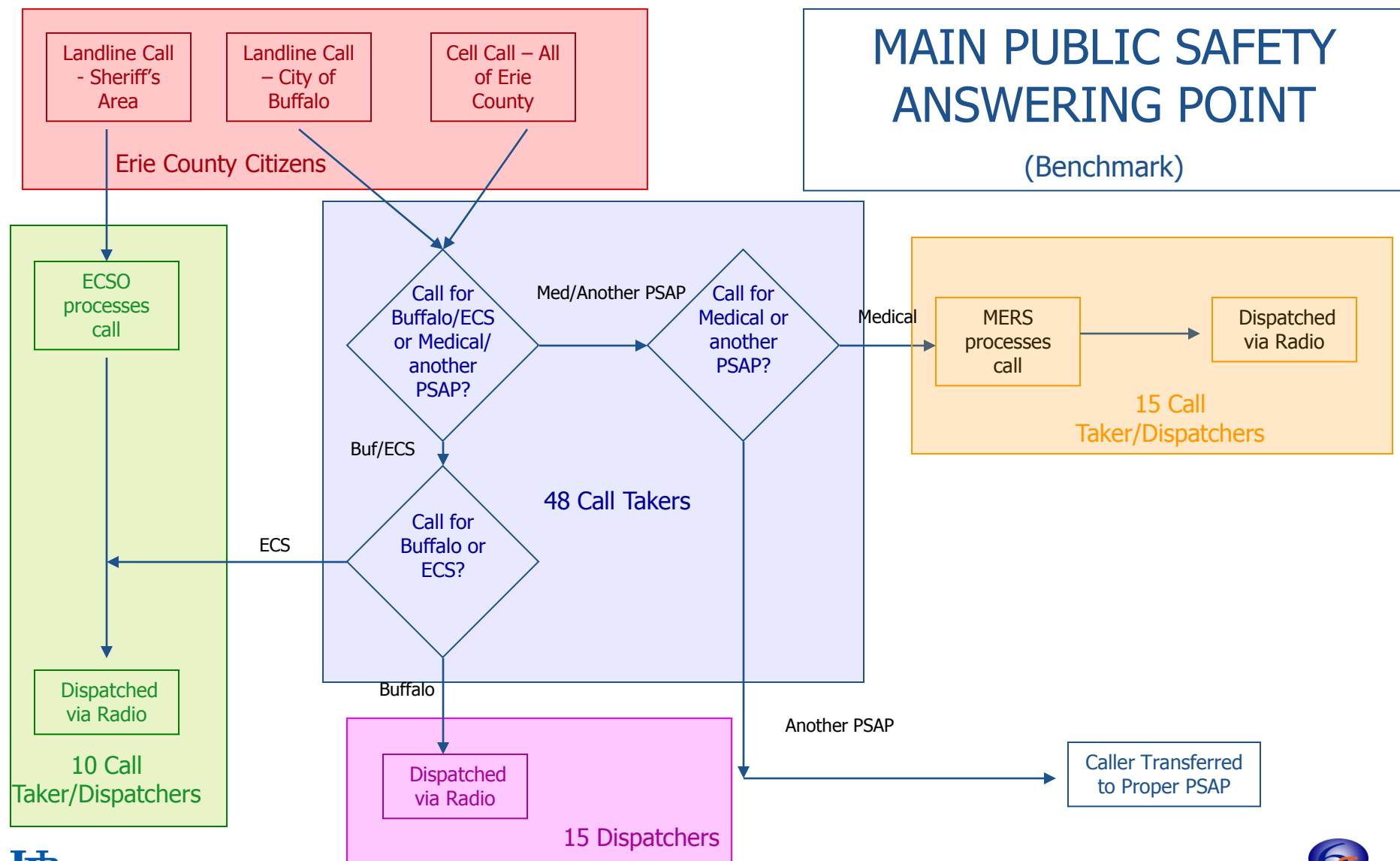


Time Series Plot of Erie County PSAPs



Without Downtown PSAP

Measure Phase
Process Flow Diagram





What is the National Benchmark?

- ☐ Association of Public Safety Communications Officials (APCO)
- ☐ 9-1-1 National Emergency Number Association (NENA)

What is a New York Benchmark?

- ☐ Monroe County
- ☐ Onondaga County
- ☐ New York City

How Does Erie County Measure UP?





DOWNTOWN PSAP

- ❑ Answers over 800,000 calls each year

*That is 80% of the total emergency calls **county wide***

- ❑ Answers **ALL** cell phone 9-1-1 calls

Cell calls account for 70% of all 9-1-1 calls

- ❑ Transfers 160,000 calls to other PSAPs each year

Not Consistent with Best Practices





Test for Equal Variances: 2008 CPS 911 calls, 2007 CPS 911 calls

95% Bonferroni confidence intervals for standard deviations

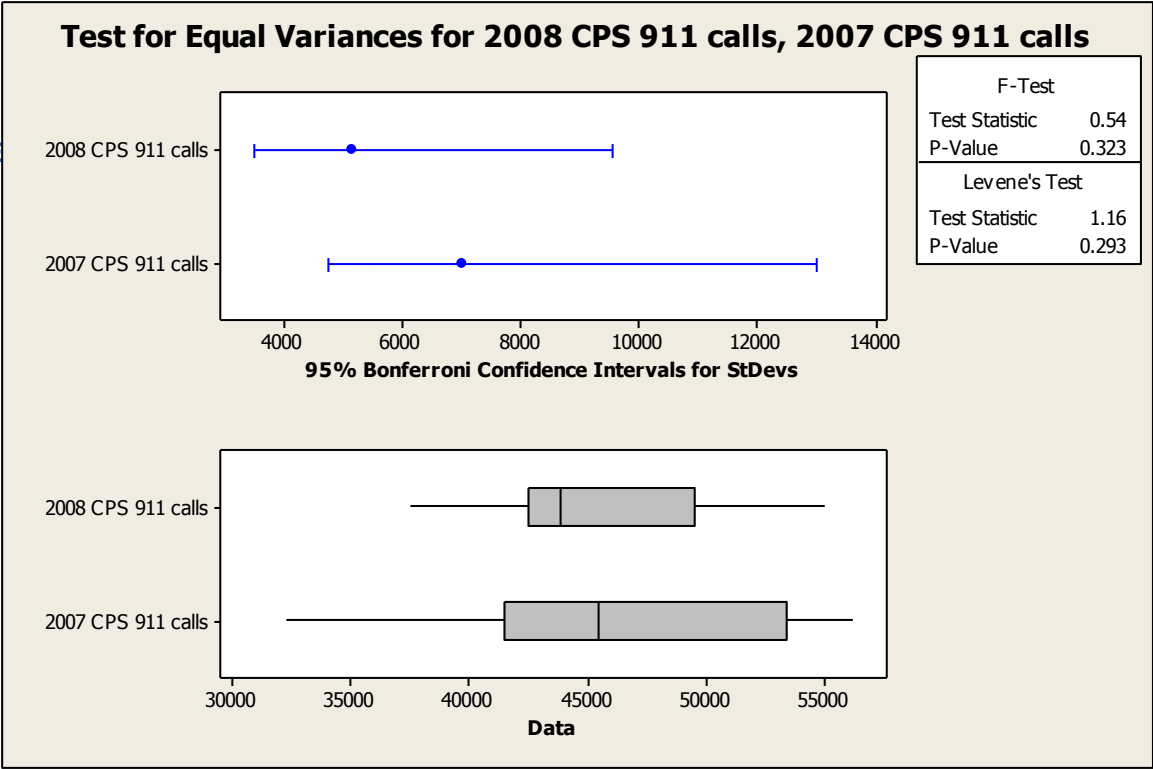
	N	Lower	StDev	Upper
2008 CPS 911 calls	12	3495.40	5169.05	9555.0
2007 CPS 911 calls	12	4751.72	7026.92	12989.3

F-Test (Normal Distribution)

Test statistic = 0.54, p-value = 0.323 **CONCLUDE**

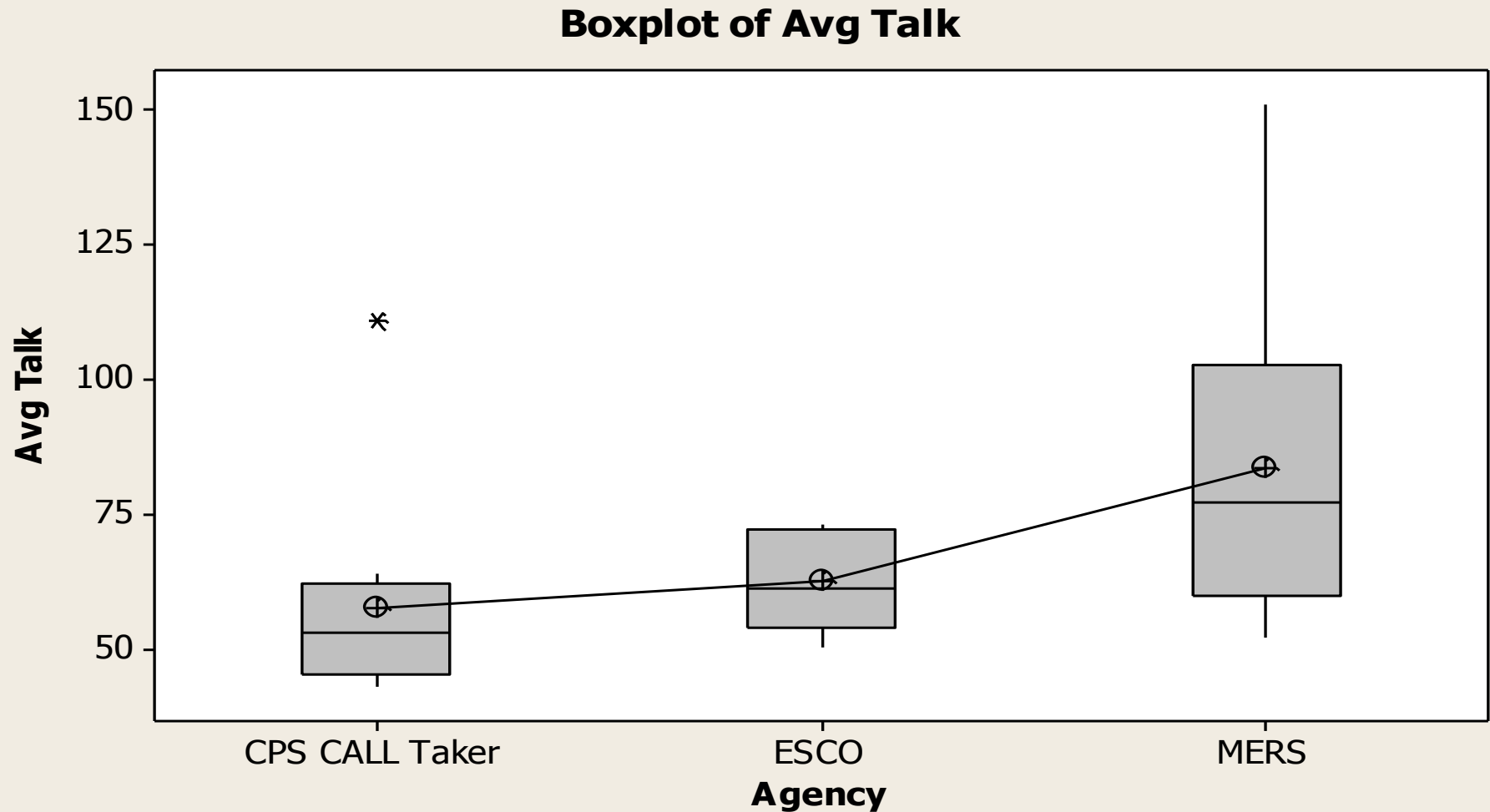
Levene's Test (Any Continuous Distribution)

Test statistic = 1.16, p-value = 0.293





So are there any differences???
We compared 30 sample call takers for 1 year



Emergency Medical Talks Longer ... why???





So are there any differences???
We compared 30 sample call takers for 1 year

SO Why the differences?

This where the **TEAM** shines... their expertise gives us a starting point to figure this out.

CPS rarely puts citizens on hold ... they have one main job – gather the facts.
No need to put on hold.

ECSO has a longer Ring Time they are also dispatching, so they cannot always pick up the phone *because they are on the radio.*

MERS talks longer per call ... *they give medical Pre-arrival Instructions.*

Each discipline has differing needs ... each PSAP has different jobs.
Should we look at this???

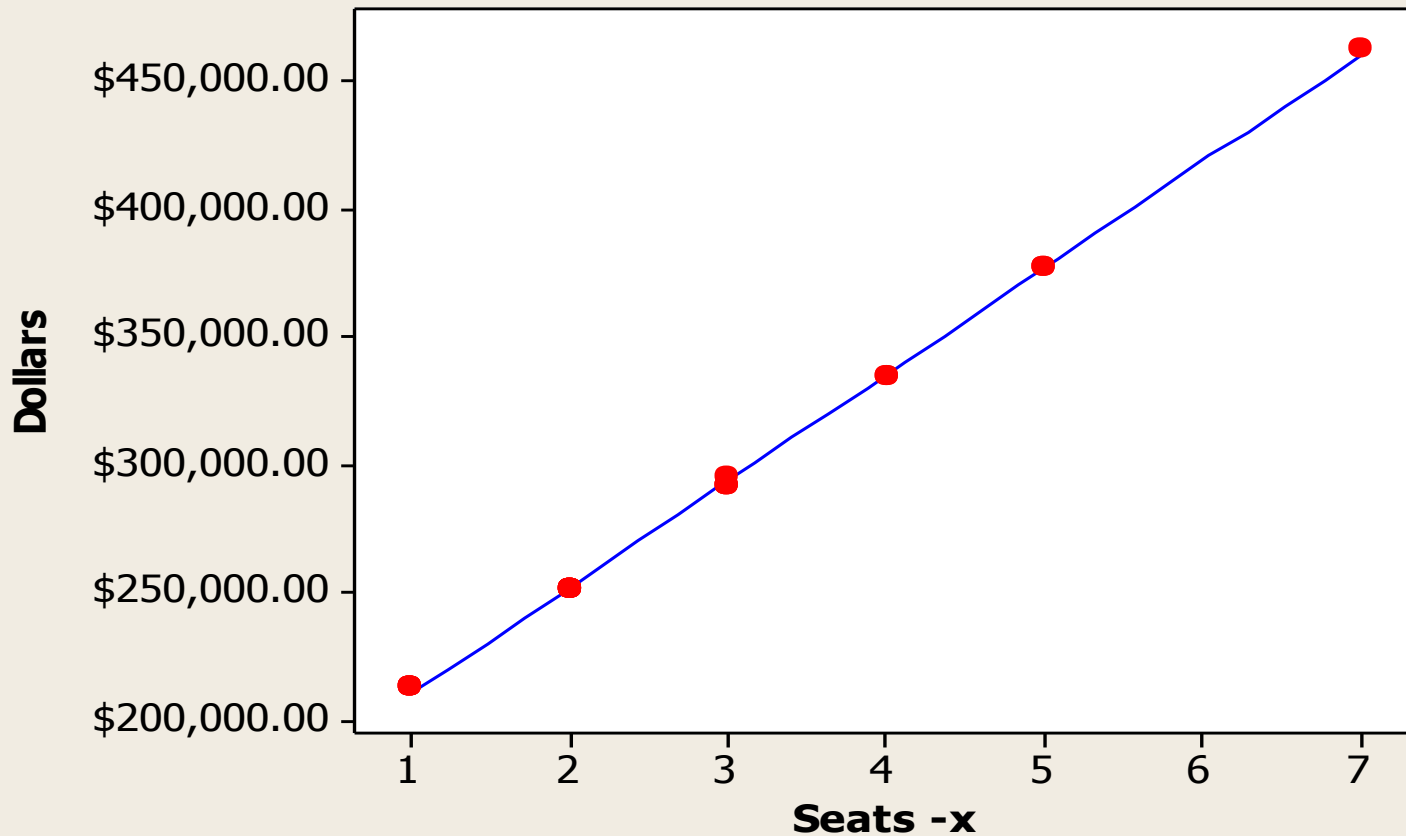




Verizon Cost equation for Equipment

Fitted Line Plot

$$\text{Dollars} = 168305 + 41692 \text{ Seats} - x$$



S	1686.07
R-Sq	99.9%
R-Sq(adj)	99.9%

Cost Over 5 Years By Number of Seats

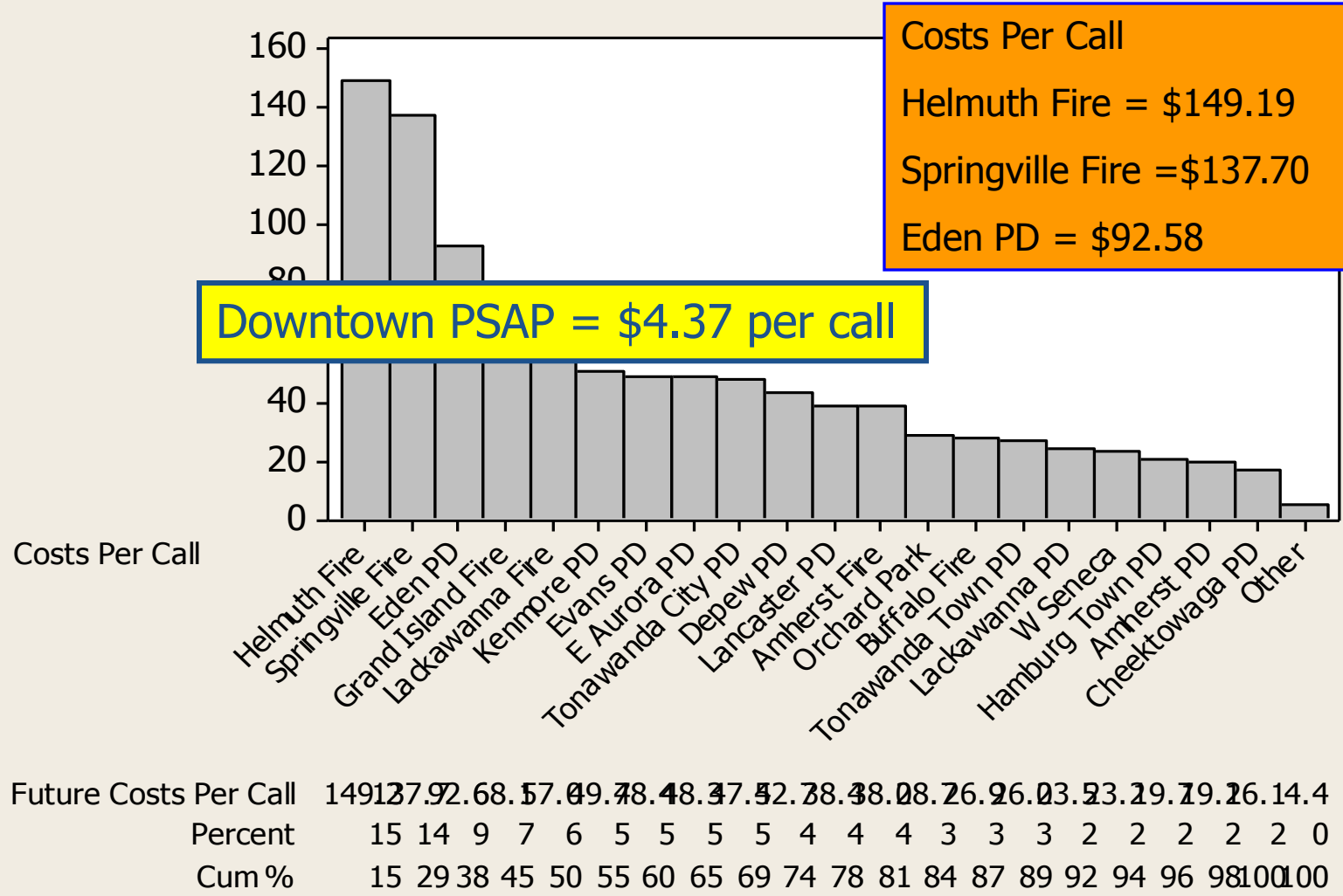


COST PER CALL PER PSAP



Pareto Chart of Future PSAP Costs

Future Costs Per Call



STATISTICAL ANALYSIS



Executive Summary of Benchmark Phone Conference Meetings with Monroe & Onondaga:

- ❑ **One County-wide dispatch center**
- ❑ **It is critical to build trust; First Responders need to be involved right from the beginning.**
- ❑ **Consolidating E-911 services was not easy**
- ❑ **Resulting consolidated centers run efficiently and have been accepted by the citizens of the municipalities as the “norm”.**
- ❑ **Erie County should consider picking up the costs of the entire project,**
- ❑ **Where appropriate, fees can be charged back to the municipalities but still saving them thousands of \$\$\$.**
- ❑ **A Back-up center is essential to the success of the project.**

This summary was based on questions submitted in advance to the counties and all Team Members participated. Answers are included in the detail report.





How many calls do they handle each year?

	Monroe County PSAP	PSAP (Downtown)	
2008 Total Calls (Rounded)	1,200,000	700,000	Please see Worksheet "Computations" for details
Calls per Public Safety Dispatcher	7500	7526.88	

Conclusion: Using Monroe County as a Benchmark, an average Public Safety Dispatcher processes **7,500 calls** in one year. Erie County's PSC staff averaged **7,527 calls**. The Downtown PSAP is equal to the Monroe PSAP Public Safety Answering Point.





WHAT SOLUTIONS are proposed?

How many PSD's does Erie County need to answer calls in the other 20 PSAPs?

Narrative: The Benchmark PSAP (Monroe) can answer 7,500 calls in a year per PSD as calculated above. There are approximately 200K calls total in the other Erie County PSAPs.

	Monroe County		PSAPS in Erie County outside of the PSC	
2008 Total Calls (Rounded)	1,200,000		199,309	See Worksheet "Computations" for details
Calls per Public Safety Dispatcher	7500		7500	
Number of Public Safety Dispatchers	160	<i>Actual</i>	27	<i>Calculated</i>

Conclusion: Erie County can answer and dispatch the calls in the 20 outside PSAPs with 27 Public Safety Dispatchers.

How many extra seats are needed to accommodate all of Erie County Calls?

	PSC Staff	Seats	Ratio	Notes
Current Situation	93	23	4.04348	1 seat = 4.04 PSDs
Additional Staff Needed	27	7		<i>rounded</i>
Totals	120	30		

Conclusion: Erie County has enough space in its current Downtown PSAP





WHAT SOLUTIONS are proposed?

PSAP Proposals

Apr-09

Proposals	No of PSAPS	No of Positions	FIVE YEAR COSTS		
			Erie County Costs over 5 years	Network Costs over 5 years	Total Equipment & Maintenance
(A) Update all Centers with New Hardware/Software	21	123	\$8,998,100	\$0	\$8,998,100
(B) Hosted Solution 2 Geo Diverse Centers with remotes	21	115	\$8,505,706	\$1,620,000	\$10,125,706
(C) Hosted Solution 5 Centers with remotes (non-Geo Diverse)	21	115	\$9,266,058	\$2,160,000	\$11,426,058
(D1) Five Regional PSAPS - Non Geo Diverse	5	84	\$4,511,958	\$2,460,000	\$6,971,958
(D2) Five Regional PSAPS -Geo Diverse	5	84	\$7,476,600	\$2,460,000	\$9,936,600
(E1) Two Equal PSAPS backing each other up	2	64	\$4,929,188	\$480,000	\$5,409,188
With extra PD networking				\$1,620,000	\$6,549,188
(E2) Two Equal PSAPS; one unmanned	2	64	\$4,929,188	\$1,620,000	\$6,549,188





WHAT SOLUTIONS are proposed?

PSAP Proposals

Apr-09

Proposals	No of PSAPS	No of Positions	FIVE YEAR COSTS			1 YEAR STAFFING COSTS		5 YEAR	FIVE YEAR Total Costs
			Erie County Costs over 5 years	Network Costs over 5 years	Total Equipment & Maintenance	Staff at Erie Co PSAP(s)	Cities, Town & Village Staff	Staffing Cost	
(A) Update all Centers with New Hardware/Software	21	123	\$8,998,100	\$0	\$8,998,100	\$4,478,415	\$7,334,503	\$69,064,590	\$68,062,690
(B) Hosted Solution 2 Geo Diverse Centers with remotes	21	115	\$8,505,706	\$1,620,000	\$10,125,706	\$4,478,415	\$7,334,503	\$69,064,590	\$69,190,296
(C) Hosted Solution 5 Centers with remotes (non-Geo Diverse)	21	115	\$9,266,058	\$2,160,000	\$11,426,058	\$4,478,415	\$7,334,503	\$69,064,590	\$70,490,648
(D1) Five Regional PSAPS - Non Geo Diverse	5	84	\$4,511,958	\$2,460,000	\$6,971,958	\$4,478,415	\$4,911,810	\$46,951,125	\$53,923,083
(D2) Five Regional PSAPS -Geo Diverse	5	84	\$7,476,600	\$2,460,000	\$9,936,600	\$4,478,415	\$4,911,810	\$46,951,125	\$56,887,725
(E1) Two Equal PSAPS backing each other up	2	64	\$4,929,188	\$480,000	\$5,409,188	\$8,956,830	\$0	\$44,784,150	\$50,193,338
With extra PD networking				\$1,620,000	\$6,549,188	\$8,956,830	\$0	\$44,784,150	\$51,333,338
(E2) Two Equal PSAPS; one unmanned	2	64	\$4,929,188	\$1,620,000	\$6,549,188	\$5,778,600	\$0	\$28,893,000	\$35,442,188

Improve Phase

Solutions

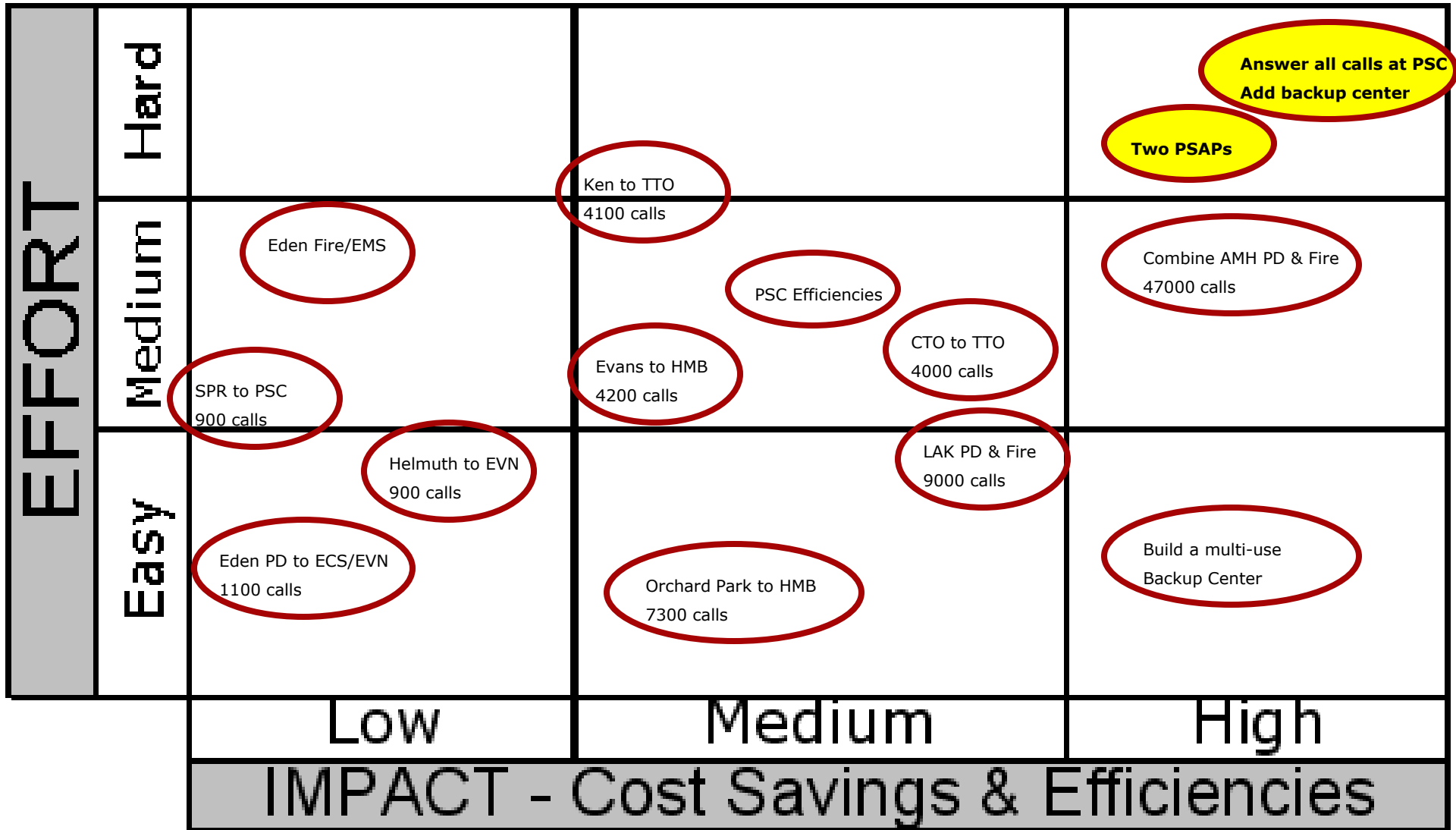


	Equipment & Maintenance 5yrs	Staffing - County Costs	Staffing - Municipalities	Total
Worse Case Scenario	\$11.4 MIL	\$ 22 MIL	\$36.5 MIL	\$70 MIL
Optimum Scenario	\$6.5 MIL	\$44.7 MIL	\$0	\$ 51.3 MIL
SAVINGS				\$19.7 MIL





WHAT SOLUTIONS are proposed?





SOLUTION IMPLEMENTATION STRATEGY

Team:

- Bring in Project & Network Engineer (Verizon)
- Re-evaluate team – more input needed from PSAPs involved
- Visit Monroe Communications center
- Create RFP for new equipment:
 - Ask for alternatives; Position for Next Gen 9-1-1

Low- Medium Hanging Fruit:

- Meet with Springville Fire Control and Town Supervisors
- Meet with Helmuth Fire Control
- Meet with Eden PD and Town Supervisors
- Meet with Amherst PD & Fire
- Revisit Downtown PSAP configuration – “Get our own house in order”





SOLUTION IMPLEMENTATION STRATEGY

First Steps:

- **Use The Fire Academy in Cheektowaga as a backup temporarily**
- **Form Advisory Board – write policies & procedures**
 - **This will foster TRUST, consensus building and eventually credibility**
 - **Provide seat at PSAP for agencies to observe, learn and work**

Next Steps:

- **Build appropriate back-up center**
- **Don't repeat past mistakes**
- **We have been using 20+ PSAPS for close to 25 years**
Ask WHY?

Summary:

- **We have a long term goal – let's not lose sight of it**
- **Start with attainable steps working toward that goal**
- **Public Safety is paramount**

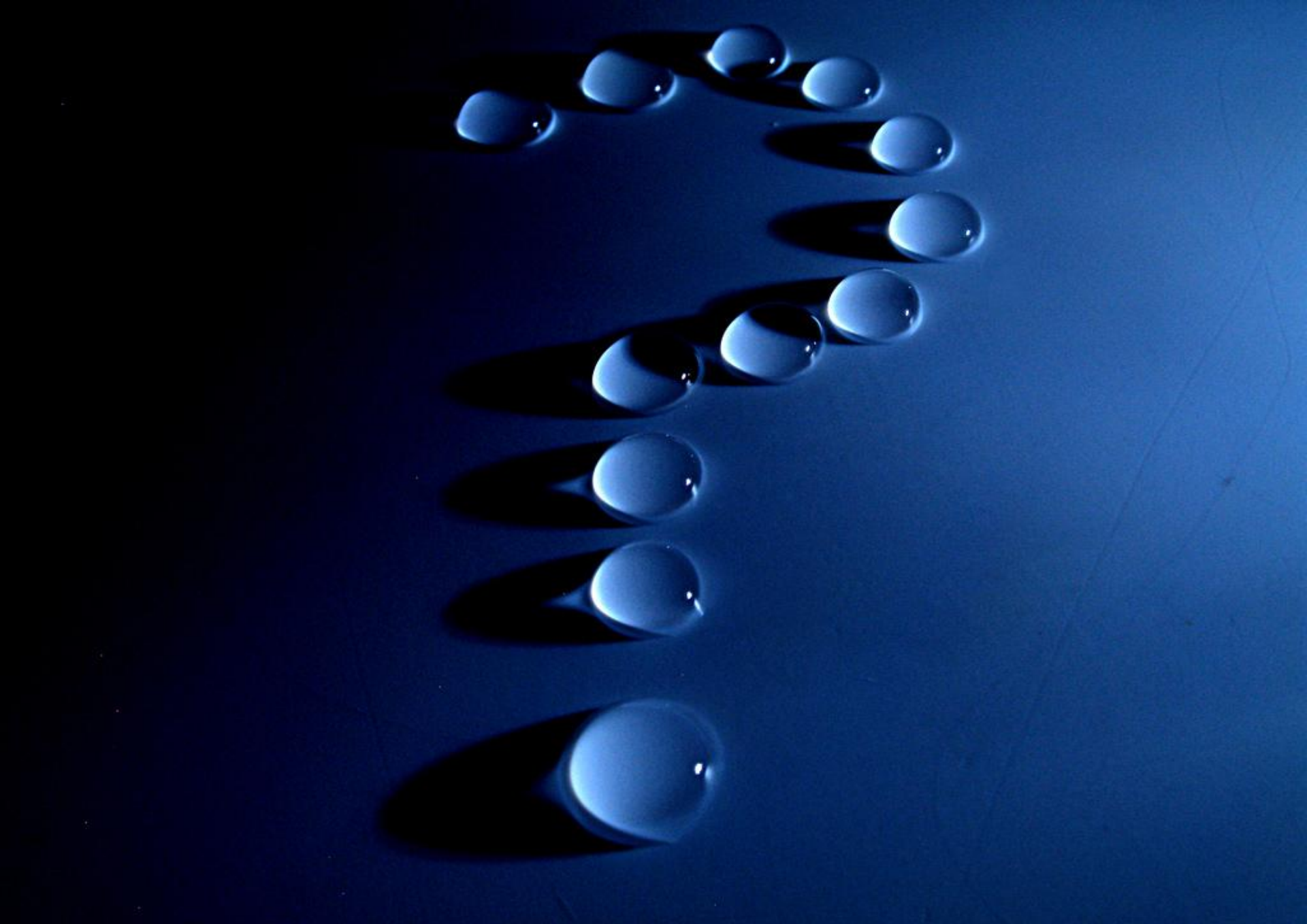


SIX SIGMA TOOLS USED



Define	Measure	Analyze	Improve	Control
<ul style="list-style-type: none"> ✓ Problem Statement <input type="checkbox"/> Macro Map <input type="checkbox"/> Identify Customers ✓ Project Scope ✓ Primary Metric <input type="checkbox"/> Secondary Metric <input type="checkbox"/> Consequential Metric ✓ Baseline Data <input type="checkbox"/> Entitlement ✓ Objective Statement ✓ Financial Estimates ✓ Non-financial Benefits ✓ Team Members 	<ul style="list-style-type: none"> ✓ SIPOC Diagram ✓ Process Flow Diagram <input type="checkbox"/> Value Analysis/ Muda ✓ Detailed Flow (I/O) <input type="checkbox"/> Measurement System Analysis <input type="checkbox"/> Capability Analysis <input type="checkbox"/> Short Term Capability ✓ Long Term Capability ✓ Data Collection ✓ Process Monitoring <input type="checkbox"/> Lean Opportunities <input type="checkbox"/> C & E Fishbone <input type="checkbox"/> C & E Matrix 	<ul style="list-style-type: none"> ✓ Potential X's ✓ Graphical Analysis <input type="checkbox"/> Hypothesis Testing <input type="checkbox"/> Means ✓ Variance <input type="checkbox"/> Proportions <input type="checkbox"/> ANOVA ✓ Regression Analysis <input type="checkbox"/> FMEA <input type="checkbox"/> ID Critical X's ✓ Quick Improvements ✓ Lean Improvements <input type="checkbox"/> Process Tracking 	<ul style="list-style-type: none"> Regression Analysis <input type="checkbox"/> DOE Planning <input type="checkbox"/> Screening DOEs <input type="checkbox"/> Quantifying DOEs <input type="checkbox"/> Optimizing DOEs <input type="checkbox"/> Verify Critical X's <input type="checkbox"/> Y = F(x) <input type="checkbox"/> Optimization ✓ Generate Solutions ✓ Select Solutions <input type="checkbox"/> Pilot Trials <input type="checkbox"/> Capability Analysis 	<ul style="list-style-type: none"> <input type="checkbox"/> Control Methods <input type="checkbox"/> Control Plans <input type="checkbox"/> Poka-Yoke <input type="checkbox"/> SPM – Monitor Y <input type="checkbox"/> SPC – Control X's <input type="checkbox"/> OCAP <input type="checkbox"/> Update FMEA ✓ Project Transition Action Plans <input type="checkbox"/> Update Financial Benefits <input type="checkbox"/> Final report <input type="checkbox"/> Close Project
<input type="checkbox"/> Define Review	<input type="checkbox"/> Measure Review	<input type="checkbox"/> Analyze Review	<input type="checkbox"/> Improve Review	<input type="checkbox"/> Control Review







SOLUTION IMPLEMENTATION STRATEGY

3rd Quarter 2009 Update

- Re-evaluate team – more input needed from PSAPs involved
 - Larger team with members of Police, Fire & EMS formed.
 - Meetings held: 7/2, 7/31, 9/15, 10/1 and 10/5
- Visit Monroe Communications center
 - Not scheduled
- Create RFP for new equipment:
 - Ask for alternatives; Position for Next Gen 9-1-1
 - Draft RFP: review 10/5 by committee
 - Final RFP: due 10/15

